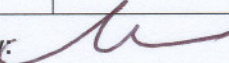
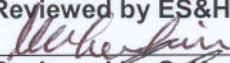
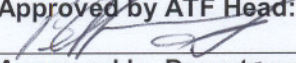
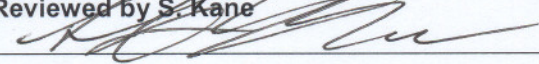
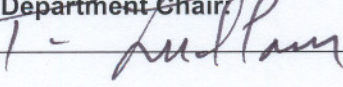


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PHYSICS DEPARTMENT		Effective: 06/01/2007	Page 1 of 4
Subject: Inspection Procedure for CO ₂ TeraWatt Laser Amplifier Pressure Vessel		Prepared by: 	
Reviewed by ES&H Coordinator: 		Approved by ATF Head: 	
Reviewed by S. Kane 		Approved by Department Chair: 	

INSPECTION PROCEDURE FOR CO₂ TERAWATT LASER AMPLIFIER PRESSURE VESSEL

1. Scope

This procedure defines the periodic inspection of the ATF CO₂ TeraWatt Laser amplifier pressure vessel. The inspection shall be carried out every 6 months or 4000 hours of pressurized time whichever comes first. This procedure has been entered into the ATF Notification System, a computer-based system that sends notifications to individuals responsible for maintenance or periodic tests and procedures.

2. Prerequisites

The Laser Amplifier vessel will be depressurized, and disassembled at the main longitudinal flange. The two sections will be separated to allow access. A Qualified engineer will be notified prior to the start of inspection. The engineer or his designee shall witness all inspections.

3. Inspection Test Report

The Inspection Test Report(s) may be compiled by the witnessing inspector; but the specific test section shall be filled out, signed and dated by the person performing the actual inspection.

Use "ATF CO₂ TeraWatt Laser Amplifier Inspection Test Report", latest revision, as needed.

Completed Inspection Test Report(s) shall be submitted to the Physics Department's ES&H Coordinator for acceptance.

4. Procedure

4.1 Main O-Ring Seal

Visually inspect the O-ring Seal for nicks cuts and abrasions. Replace O-ring if any damage is present.

Note: Replacement O-ring shall be new and of Viton material. A qualified engineer or his designee shall size O-ring.

4.2 Pressure Vessel Welds

Note: A qualified inspector per standard BNL specifications shall conduct all Liquid Penetrant Inspections (LPI). Furthermore, at the discretion of the qualified

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engineer, LPIs may be replaced or supplemented by other Non-Destructive Examinations (NDE).

Visually inspect all pressure vessel welds for cracks or voids. No defects are allowed. If there are any questionable areas, an initial LPI shall be performed. If a defect is found it shall be repaired as follows:

- a) Remove defects by grinding to "sound" base material.
- b) LPI the repaired area. No defects allowed.
- c) Weld repair using Central Shops division Weld Procedure SS-1-92, latest revision.
- d) Visual and final LPI shall be performed on repaired area. Repair to longitudinal seam welds shall also be inspected for adequate material thickness. No defects allowed. Any repair of seam weld must be of equal or greater thickness than surrounding base material.

5. Submittals

All inspection test reports shall be submitted to the Physics Department's ES&H Coordinator for acceptance.

6. Release for Operations

The Physics Department engineer or his designee submits copies of all appropriate reports to the Department's Manager of ESH&T Programs for his acceptance. If no defects are found the laser is released for operations.

7. Attachment

ATF CO₂ Terawatt Laser Amplifier Inspection Test Report – Rev. B

ATF CO₂ Terawatt Laser Amplifier Inspection Test Report – Rev. B

Form Completed by: _____
(Please print legibly)

Date: _____

Visual O-ring Inspection:

Technician Name: _____
(Please print legibly)

Date of Inspection: _____

O-ring: ☐ Acceptable/re-useable ☐ Must be replaced

Technician Signature: _____

Date: _____

If required; new Viton O-ring sized and purchased by:

Name: _____
(Please print legibly)

Signature: _____

Date: _____

Visual Weld Inspections:

Inspect all the following weld groups.

A separate inspection sheet shall be filled out for each weld group:

- Cylindrical shell longitudinal seal weld – both internal and external welds
- Left half – Cylindrical shell to main flange – both internal and external welds
- Right half – Cylindrical shell to main flange – both internal and external welds
- Left half – Cylindrical shell to endplate – both internal and external welds
double lap joint
- Right half – Cylindrical shell to endplate – both internal and external welds
double lap joint
- Left half – main flange to endplate – both internal and external welds
- Right half – main flange to endplate – both internal and external welds
- Port tubes to endplate welds – all locations – all welds at specific location
- Port tubes to cylindrical shell – all locations – all welds at specific location
- Port tubes to port flange – all locations – both sides of flange

ATF CO₂ Terawatt Laser Amplifier Inspection Test Report - Rev B.

I. Specific Weld Group Visually Inspected: Check One (1) Only

Technician Name: _____ Date of Inspection: _____
(Please print legibly)

- | | |
|---|---|
| <input type="checkbox"/> Cylindrical shell longitudinal seal weld: internal & external | <input type="checkbox"/> Right half cyl. shell to main flange: internal |
| <input type="checkbox"/> Left half cyl. shell to main flange: internal & external | <input type="checkbox"/> Right half cyl. shell to main flange: internal & external |
| <input type="checkbox"/> Left half cyl. shell to endplate: internal & external | <input type="checkbox"/> Right half cyl. shell to endplate: internal & external |
| <input type="checkbox"/> Left half main flange to endplate: internal & external | <input type="checkbox"/> Right half main flange to endplate: internal & external |
| <input type="checkbox"/> Left half main flange to endplate: internal & external | <input type="checkbox"/> Right half main flange to endplate: internal |
| <input type="checkbox"/> Port tubes to endplate: all locations & specific locations | <input type="checkbox"/> Port tubes to cyl. shell: all locations & specific locations |
| <input type="checkbox"/> Port tubes to port flange: all locations: both sides of flange | |

II

WELDS: ☐ Acceptable, no further action required ☐ Further NDE Inspection Required – Go to Section

Use comment section to specify specific weld(s)

Technician Signature _____ Date: _____

II. Initial NDE of Inspection Area: ☐ Weld acceptable, no further action required ☐ Weld repair required – Go to Section III

Name of NDE Inspector: _____ Date Performed: _____
(Please print legibly)

NDE Inspector's Signature: _____

III. Weld Repair

Welder Name: _____ Date Performed: _____
(Please print legibly)

- a. Defects/Voids removed by grinding to "sound" base material: ☐ Acceptable
- b. NDE of repaired area performed and acceptable ☐ Work completed

Name of NDE Inspector: _____ Date Performed: _____
(Please print legibly)

NDE Inspector's Signature: _____

c. Weld Repair Performed:

Specify welding wire and process performed: _____
☐ Work completed

d. Final NDE inspection (and thickness measurement, if required) performed and acceptable: ☐ Work completed.

Name of NDE Inspector: _____ Date Performed: _____
(Please print legibly)

NDE Inspector's Signature: _____

Welder's signature _____

Comments: _____

